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U. S. DEPARTMENT OF AGRICULTURE

FOREST SERVICE

Allegheny Forest Experiment Station
Philadelphia, Pennsylvania

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Technical Note No. 2

WINDFIRMNESS OF HEMLOCK LEFT AFTER LOGGING

During the winter of 1926-27 the hardwoods in an area in northeastern Elk County, Pennsylvania, were cut practically clean for chemical wood. Prior to the cutting, beech, eastern hemlock, sugar maple, red maple, and sweet birch constituted 93 per cent of the stand by basal area. A few yellow birch, white ash, and black cherry were also present. From the average basal area per acre of 126 square feet, 89 per cent was removed; the remainder was almost entirely hemlock, a species unmerchantable as chemical wood. Of the trees 4 inches d.b.h., and larger, 138 per acre were removed, and 18 left. Two years after the logging, the Station made a tally of all stumps, standing trees, and windfalls on seven one-half acre plots, and has prepared the attached table.

Somewhat contrary to expectations, only a small percentage of the hemlock left standing subsequently blew down. In fact, it is possible that some of the trees classified as windthrown were actually knocked down in the logging. Plots 1 to 4 were located in a continuous strip at the bottom of a 15 per cent slope near a small stream. The other three were in a strip parallel to the first but about three chains up the slope. All of the windthrow occurred on the rather wet plots nearest the creek, although these plots were somewhat less exposed to the wind than those further up the slope.

In 1904 most of the black cherry had been removed from the stand, as indicated by the last column of the table. Although the cutting may have opened the stand enough to stimulate the remaining trees to better rooting, and thus may account for this hemlock's windfirmness, the Station has observed other areas also in northern Pennsylvania where hemlock failed to live up to its reputation for easy windthrow.

O. M. Wood
Assistant Silviculturist.

September 24, 1930

Diameter, b. h. or stump	Trees and recent stumps, all species	Standing hemlock	Windthrown hemlock		Black cherry stumps 1904 cutting
Inches	Number	Number	Number	Per cent	
4	101	4		0	
6	35	7		0	1
8	54	12	2	14	10
10	94	15		0	20
12	75	4	1	20	16
14	62	6		0	33
16	51	1		0	26
18	29	4		0	10
20	19	2	1	33	4
22	10	4		0	
24	3		1	100	2
26	3	1		0	
28	5		2	100	
30 and over	3				
Totals	544*	60	7	10.4	122
Average per acre	155	17	2		35

* Includes 17 recent dead

General view of the area. Plots 1-4 lie in the right background, and plots 5-7 in the left background.